

DESCRIPTIONS OF NEW NORTH AMERICAN
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The classification of the order Thysanoptera is admittedly much in need of attention, and reliable synopses of genera and species are conspicuously wanting. A proposed treatise for the Genera Insectorum, now in preparation by Richard S. Bagnall, will do much to supply these long-felt wants; and in advance of its publication it seems desirable to make known a maximum number of so-called species, for the value of such a work of reference depends largely upon its exhaustiveness. In this paper I have thus attempted nothing more profound than the mere description of certain forms and groups of forms which appear after a morphological study to require new names for their proper designation.

SUBORDER TEREBRANTIA HALIDAY.

FAMILY ÆOLOTHRIPIDÆ HALIDAY.

Æolothrips vittipennis, new species. (Pl. IV, figs. 1, 2.)

Female.—Length about 1.5 mm. Color dark blackish brown with a reddish cast, due to dense crimson hypodermal pigmentation in the thorax, abdomen, femora, tibiæ, and the two basal antennal segments; antennæ with segment 3 and basal half of segment 4 yellowish white.

Head about as wide as long, longer than prothorax, deeply and closely transversely striate, and with numerous minute spines on occiput and cheeks; anterior border deeply emarginate by the forward production of the eyes, and with a median tubercle; cheeks strongly arcuate. Eyes moderate, prolonged on ventral surface of head, and with the more dorsal facets separated by a distance about equal to their own diameter. Ocelli equidistant, the posterior nearly contiguous to eyes. Antennæ about 2.2 times as long as head, the last four segments subequal and together shorter than the preceding; sensory area on ventral surface of segment 5 elongate, the sense cone arising from basal end; segment 3 yellowish white, becoming dark blackish brown at extreme apex; 4 yellowish white in basal half or third, excepting for the dark pedicel; remainder of antenna blackish brown. Maxillary palpi three-segmented; labial palpi four-segmented.

Frothorax subrectangular, slightly shorter than head, and nearly one and one-half times as wide as long, widest near middle; surface with numerous minute spines. Mesothorax about 1.5 times as broad as prothorax, anterior angles broadly rounded; mesoscutum very closely transversely striate. Metathorax with sides roundly converging posteriorly; metascutum subreticulate. Wings of fore pair slender, about 8.5 times as long as width at middle, of nearly equal breadth throughout; venation normal; anal half occupied by a longitudinal black band which extends from the

extreme base, across the scale, and to the tip of the wing, sometimes showing a tendency to form a transverse band just beyond the basal third;¹ hind wings white or grayish. Legs normal to genus, the fore femora slender.

Abdomen slender, normal to the genus.

Male.—Length about 1.1 mm. Fore wings with a transverse black band just beyond the basal third, in addition to the longitudinal band on posterior half. Abdomen very slender; ninth segment nearly as long as wide, narrowed toward apex, and without clasping organs.

Measurements of holotype: Length 1.48 mm.; head, length 0.180 mm., width 0.197 mm.; prothorax, length 0.148 mm., width 0.218 mm.; mesothorax, width 0.320 mm.; abdomen, width 0.342 mm. Antennal segments: 1, 36 μ ; 2, 50 μ ; 3, 114 μ ; 4, 87 μ ; 5, 58 μ ; 6, 12 μ ; 7, 13 μ ; 8, 13 μ ; 9, 11 μ ; total length of antenna, 0.39 mm.; width at segment 4, 0.026 mm.

Described from 10 females and 8 males, taken on honey locust (*Gleditsia triacanthos* L.), at Topeka, Illinois, May 23, 1909, and August 7, 1908, by Mr. Charles A. Hart, and one living female from Washington, D. C., July 28, 1912, J. D. H., on yellow locust (*Robinia pseudacacia* L.).

Type locality: Topeka, Illinois.

In the coloration of the wings, this species resembles *A. vittatus* Haliday and *A. kuzwanii* (sic!) Moulton, which occur, respectively, in Europe and the Pacific coast region of North America. From both it may be known by the longer head, shorter prothorax, and the details of wing coloration. In addition to these characters, it is also to be noted that in *kuzwanii* only the third antennal segment is white, the spine-bearing sense area on the ventral surface of the fifth antennal segment is circular in form, the head is not emarginate in front, and, most important of all, the ninth abdominal segment of the male is provided with lateral claspers.

Aeolothrips crassus, new species. (Pl. IV, figs. 5, 6.)

Female.—Length about 1.5 mm. Color dark blackish brown, with a reddish cast, due to crimson hypodermal pigmentation in the thorax abdomen, and femora; antennæ with segments 3 and 4 pale yellowish white, the latter blackish at extreme apex.

Head about 1.3 times as wide as long, about as long as prothorax, not transversely striate, and with minute spines on occiput and cheeks; anterior border not deeply emarginate by a forward prolongation of the eyes, and without median tubercle; cheeks slightly swollen. Eyes moderate in size, prolonged as usual on ventral surface of head, and with the more dorsal facets separated by a distance much less than their own diameter. Ocelli equidistant. Antennæ nearly 2.5 times as long as head, unusually stout; segment 3 about equal to 1+2 and only about three times as long as

¹ This band always finds its complete development in the male.

wide; 4 subequal to 3; 5-9 together nearly 1.3 times as long as 3, the last four segments subequal and together about equal to the one preceding; sensory area on ventral surface of segment 5 circular. Maxillary palpi three-segmented; labial palpi four-segmented.

Prothorax about two-thirds as long as greatest width, distinctly broadened behind. Mesothorax a little less than 1.4 times as broad as prothorax, anterior angles broadly rounded; mesoscutum very closely transversely striate. Metathorax with sides roundly converging posteriorly; metascutum subreticulate. Wings of fore pair moderately slender (about seven times as long as width at middle), slightly narrower in basal third; venation normal, or with the lower subapical cross-vein wanting; anal half of wing traversed by a longitudinal black band which extends from the basal fifth to the tip of the wing, becoming paler and narrower at apex, and, in the second fifth, broadened to nearly the costal margin; hind wings grayish. Legs short and stout, the fore femora only about one and one-half times as long as wide.

Abdomen stout, of normal structure.

Measurements of holotype: Length 1.55 mm.; head, length 0.162 mm., width 0.209 mm.; prothorax, length 0.168 mm., width 0.264 mm.; mesothorax, width 0.360 mm.; abdomen, width 0.432 mm. Antennal segments: 1, 36 μ ; 2, 54 μ ; 3, 92 μ ; 4, 90 μ ; 5, 57 μ ; 6, 14 μ ; 7, 14 μ ; 8, 14 μ ; 9, 14 μ ; total length of antenna, 0.39 mm., width at segment 4, 0.030 mm.

Described from one female, taken on Plummer's Island, Maryland (in the Potomac River near Washington, D. C.), May 19, by W. L. McAtee and the writer. It was found in a flower of *Hydrophyllum virginicum* L.

This species, like the preceding, is related to *kuzvanii* and *vittatus*. From the former it may be known by the white fourth antennal segment and the stouter facies; from the latter its separation is more difficult, judging from the brief published descriptions, but should be distinct by the longer segments 5-9, which together are fully a fifth longer than segment 3, instead of subequal to it as in *vittatus*. The latter is known only from England, Finland, Sweden, and Austria-Hungary (Dalmatia).

With the specimen above described, I have doubtfully associated another female, taken on a conifer at Urbana, Illinois, May 21, 1908, by J. V. Bopp, then a student in the University of Illinois. It agrees with the type in most respects, but the third antennal segment is slenderer and darkened at tip, the basal transverse band on the wing is complete, and a second band shows a tendency to appear near the apex of the wing, just basal to the apical seventh.

FAMILY THIRIPIDÆ HALIDAY.

Genus **MEROTHRIPS** nov.

(μῆρός, the femur; θρεψ, a wood worm.)

Head rather elongate, anteriorly obtusely angulate, with a pair of long bristles on dorsum between eyes and antennæ. Eyes (in the type species) greatly reduced; ocelli wanting. Antennæ long, approximate, eight-segmented, moniliform, inserted on ventral surface of head; segments 3 and 4 with sense areas (instead of sense cones) at apex; segment 8 elongate, fusiform. Mouth cone equal in length to face, semicircularly rounded at apex; maxillary palpi three-segmented; labial palpi two-segmented. Prothorax trapezoidal, broader than long and somewhat longer than head, with a pair of subparallel longitudinal sutures separating the notum from pleuron and coxa; posterior angles with a single long bristle. Legs very stout; metacoxæ separated by less than their own diameters; mesocoxæ separated by an interval thrice as great; fore and hind femora greatly enlarged; male with a broad subbasal tooth on inner margin of fore femur and with a long, stout tooth on inner margin of fore tibia at tip. Abdomen moderately slender, exceedingly blunt at tip, the apical segments very transverse and with long, weak spines; ovipositor greatly reduced, certainly functionless; abdomen of male without ventral sensory areas and without strong, chitinous projections on apical segments.

Type: Merothrips morgani, new species.

In the weakened, pale cuticula, reduced organs of vision, enlarged femora, and functionless ovipositor, the whole insect shows a remarkable adaptation to life under bark and in other similarly secluded places—a habit until now wholly unknown among the Thripidæ. The affinities of such an anomalous genus may be thought open to speculation, but, in our present arrangement of the genera of this family, it seems to take a natural position just after *Chirothrips*. The ancestors of this form were almost certainly *Chirothrips*-like Thripidæ which, originally passing only the winter under bark, became gradually adapted to that method of life as a fixed habit, through finding there suitable food and adequate protection, both from enemies and unfavorable climatic conditions. The loss of the ovipositor is easily explained, for, as in the *Tubulifera*, there is no need to hide the eggs in plant parenchyma to avoid their being injured, because under bark may be found safe hiding places in plenty.

Merothrips morgani, new species. (Pl. v, figs. 1-3.)

Female.—Length about 0.8 mm. Color pale grayish yellow, gray, or brown, with head, legs (especially the anterior pair), and first two antennal segments suffused with yellow.

Head smooth, about 1.25 times as long as wide, broadest at basal third, cheeks evenly arcuate to eyes and base of head; vertex flattened, angulate in front, the sides forming an angle of 125° , and with a pair of prominent, post-antennal bristles equal in length to segments 1+2 of antennæ; frontal costa notched at 90° ; two pairs of bristles behind eyes, the inner pair shorter and subequal to, or rather longer than, a third pair between eyes. Eyes rudimentary, only about three facets visible in lateral profile. Ocelli and ocellar pigment entirely wanting. Antennæ long and slender, about 2.7 times as long as head; base of segment 1 hidden by vertex; form and structure well shown in figure (Pl. v, fig. 1).

Prothorax trapezoidal, about 1.2 times as long as head and (inclusive of coxæ) about 1.4 times as broad as long and 1.8 times as broad at base as at apex, with faint anastomosing lines of sculpture; notum not attaining lateral margins, separated from the pleural plate and the coxa by a longitudinal, sinuate suture extending from the anterior angle to the base; mediad to this suture often a longitudinal carina attaining about middle of prothorax; several short bristles present in addition to the long pair at the posterior angles (Pl. v, fig. 2). Pterothorax reduced, subequal in width to prothorax; mesonotum with a pair of prominent bristles on each side near anterior angles; mesosternum with two prominent bristles at extreme lateral margin, metasternum with one. Legs exceedingly stout, fore and hind femora greatly enlarged, the former nearly as wide as head, and the latter two-thirds as wide as long. Wings lacking.

Abdomen about 2.66 times as long as wide, broadest at about segment 6, weak and very blunt at apex; terminal bristles long, slender, and transparent, a lateral pair on segment 9 about five-sixths as long as greatest width of abdomen.

Measurements of holotype: Length 0.823 mm.; head, length 0.089 mm., width 0.071 mm.; prothorax, length 0.105 mm., width 0.147 mm.; pterothorax, width 0.144 mm.; abdomen, width 0.176 mm. Antennal segments: 1, 23 μ ; 2, 27 μ ; 3, 38 μ ; 4, 35 μ ; 5, 26 μ ; 6, 28 μ ; 7, 26 μ ; 8, 36 μ ; total length of antenna, 0.24 mm.; width at segment 4, 0.016 mm.

Male.—Length about 0.75 mm. Last two abdominal segments distinctly yellowish. General structure as in female. Fore femur toothed on inner margin near base; inner side of fore tibia produced at apex in a stout, acute tooth. Dorsum of head apparently minutely granulate, certain of these granules darker and arranged in anastomosing lines. Apex of abdomen suggestive of that of *Chirothrips*, all bristles slender. Accessory sexual organs heavily chitinized; testes not visible.

Described from 3 females and 1 male, as follows: Homer, Illinois, October 3, 1908, under loose bark on shellbark hickory tree, J. D. H., 1 female; Olney, Illinois, November 19, 1908, from branch of post oak (*Quercus stellata* Wang.), L. M. Smith, 1 female; Illinois, July, 1909, in burrows of freshly-hatched larvæ of *Oncideres cingulata* Say in dead hickory twig,

probably from the southern part of the State, J. D. H., 1 male; "Corbin, Ky., Sept. 26, 1911, in mushroom, A. C. Morgan, collector," 1 female (coll. A. C. Morgan).

Type locality: Homer, Illinois.

The name is proposed as a compliment to Mr. Morgan, who had recognized the form as generically and specifically distinct and had drawn up a description, previous to learning that my manuscript on the same species was ready for the press.

Frankliniella stylosa, new species. (Pl. v, fig. 7.)

Female.—Length about 1.3 mm. General color dark; abdomen blackish brown, slightly paler at base; ptero- and pro-thorax bright cinnamon-brown, the former with sides and notum tinged with gray, the latter distinctly darker with blackish; head yellowish gray, darkened with blackish at base, and (by reflected light) with vertex and inner and posterior margins of eyes almost white; antennæ grayish brown, segment 2 darkest, bases of 3, 4, and 5 pale; fore wings washed with blackish, slightly paler in basal fourth; legs yellowish gray, all femora darker and shaded on outer surface with brown.

Head fully 1.5 times as wide as long, conspicuously narrowed posteriorly, the breadth of its hind margin about 0.9 the greatest width of the head; occiput with a few transverse lines; interocellar and one pair of post-ocular bristles alone prominent, stout, black, the former longer; other bristles slender, pale, inconspicuous. Eyes moderate in size, normal to the genus, about three-fifths as wide as their interval. Ocelli present, posterior pair nearly opposite middle of eyes. Antennæ moderately stout, three times as long as dorsum of head, all spines long, stout, prominent; form of segments normal to genus (Pl. v, fig. 7); segment 3 subequal to or longer than 6; 8 about 1.75 times as long as 7; segment 1 gray; 2 usually decidedly darker (almost black as seen by aid of hand lens), gray-brown in color; 3 and 5 gray, paler in basal half, the latter with pedicel dark at extreme base; 4 slightly darker, less pale in basal half; 6-8 uniform gray.

Prothorax about 1.4 times as wide as long and 1.4 times as long as head, the two prominent bristles at each angle all equal in length, nearly black in color, about three-fifths as long as prothorax; posterior margin with the pair of bristles near middle similar in form and color, and two-thirds as long. Pterothorax normal to genus; a pair of dark bristles on anterior margin of metascutum nearly equal to that plate in length, the pair external to these short, slender, colorless. Legs of medium length and moderate size. Wings of fore pair only slightly paler at base; anterior margin with about 25 bristles, anterior vein with about 19, and posterior vein with about 15.

Abdomen of normal form; all bristles stout and dark in color; posterior margin of segment 8 with a series of about 15 equidistant spine-like projections on dorsum; tenth segment with longitudinal dorsal suture.

Measurements of holotype: Length 1.26 mm.; head, length 0.102 mm., width 0.167 mm.; prothorax, length 0.143 mm., width 0.208 mm.; mesothorax, width 0.288 mm.; abdomen, width 0.300 mm. Antennal segments: 1, 30 μ ; 2, 44 μ ; 3, 58 μ ; 4, 48 μ ; 5, 40 μ ; 6, 56 μ ; 7, 9 μ ; 8, 16 μ ; total length of antenna, 0.30 mm.; width at segment 4, 0.023 mm.

Described from 8 females, taken in flowers of *Viburnum acerifolium* L. and *Chionanthus virginica* L., on Plummer's Island, Maryland (in the Potomac River near Washington, D. C.), May 19, 1912, by W. L. McAtee and the writer.

This pretty species seems to be more closely allied to the African *F. schultzei* (Trybom) than to any other, resembling it in that the head is narrowed behind and the eighth antennal segment conspicuously longer than the seventh. The coloration of the body and antennæ, however, will readily distinguish the two. In North America it finds its closest relative in *F. insularis* (Franklin), but the antennal structure, as well as the coloration of body, legs, wings, and antennæ, is decidedly different in that species.

✓ ***Heliothrips punctipennis*, new species.**

Female.—Length about 0.97 mm. General color dark blackish brown to nearly black, with head and thorax distinctly paler and of a brownish yellow color, abdomen with last three segments pale; legs clear lemon yellow; antennæ grayish white, 1, 2, and 6-8 darker.

Head about 1.2 times as wide as long and slightly longer than prothorax; cheeks slightly arcuate; dorsal surface rather conspicuously reticulate, roughened between the lines of reticulation; frontal costa distinctly narrower than first antennal segment; vertex subcarinate in front of ocelli. Eyes about 1.5 times as long as their distance from posterior margin of head, scarcely protruding, setose. Ocelli of normal form and position. Antennæ twice as long as head; segment 1 subquadrate; 2 broadest in entire antenna, a little longer than wide; 3 and 4 urn-shaped, the former little less than twice as long as wide; 5 egg-shaped, pedicellate; 6 and 7 together of same form as 5, but inverted; 8 very long and slender. Segments 1, 2, and 6-8, brown, the first paler; intermediate segments nearly clear white, slightly clouded with brownish toward apex. Maxillary palpi two-segmented.

Prothorax about 1.7 times as wide as long, slightly shorter than head, and with similar reticulation; bristles few, short and well distributed, a more prominent pair near middle of anterior margin. Pterothorax somewhat broader than prothorax; membrane yellow, plates brown. Wings long, very slender, overreaching the abdomen; fore wings about eighteen times as long as width at middle, of normal venation; costal margin with about 19 bristles; principal vein with four colorless bristles, of which two are near base and two near fork; anterior vein with one bristle near base and two

near apex, all short, slender, the last brownish; posterior vein with five or six usually equidistant bristles, all slender and colorless; forewings nearly white, with apex dark brown and with a light cloud of brown at the fork of the veins; hind wings brownish, with darker median vein.

Abdomen slender, ovate, pointed at tip; notum subreticulate, more faintly at middle; segment 10 with longitudinal dorsal suture.

Measurements of holotype: Length 0.972 mm.; head, length 0.114 mm., width 0.142 mm.; prothorax, length 0.102 mm., width 0.178 mm.; mesothorax, width 0.216 mm.; metathorax, width 0.197 mm.; abdomen, width 0.246 mm. Antennal segments: 1, 18 μ ; 2, 36 μ ; 3, 41 μ ; 4, 34 μ ; 5, 30 μ ; 6, 24 μ ; 7, 12 μ ; 8, 29 μ ; total length of antenna, 0.22 mm., width at segment 4, 0.021 mm.

Described from 5 females, 2 of which were taken in sweepings at Matamoros, Mexico, June 30, 1908, and 3 from Brownsville, Texas, December 8, 1910, in sweepings from Bermuda grass (*Cynodon dactylon* (L.) Pers.). All were collected by Mr. Hart.

Type locality: Matamoros, Mexico.

The small size of this species and the peculiar coloration of the legs and wings should make it easy of recognition. It belongs in the vicinity of *fasciatus*, *fasciapennis*, and *phaseoli*.

***Heliothrips marginipennis*, new species.**

Female.—Length about 1.1 mm. Color dark blackish brown to nearly black, very slightly, if any, paler anteriorly; legs brown, the femora and tibiae yellow at extremities; tarsi yellow; antennal segments 1, 2, and 6–8 nearly concolorous with body, intermediate segments brownish yellow and more or less clouded with brown.

Head about 1.2 times as wide as long, equal in length to prothorax; cheeks nearly straight and parallel; dorsal surface conspicuously reticulate, more particularly so behind an irregular transverse line at basal fourth; frontal costa distinctly narrower than first antennal segment. Eyes very slightly longer than their distance from posterior margin of head, slightly prominent, setose. Ocelli of normal form and position. Antennae twice as long as head; segment 1 subquadrate; 2 broadest in entire antenna, a little longer than wide; 3 and 4 urn-shaped, the former slightly more than twice as long as wide; 5 almost perfectly egg-shaped, pedicellate; 6 and 7 together of same form as 5, but inverted; 8 very long and slender. Segments 1, 2, and 6–8 blackish brown, the first paler; intermediate segments pale brownish yellow, 3 and 4 darkly clouded with brown just beyond middle, 5 dark brown in apical two-thirds. Maxillary palpi two-segmented.

Prothorax about 1.7 times as wide as long, equal in length to head and with similar reticulation; bristles few, short, well distributed, a more prominent pair near middle of anterior margin. Pterothorax somewhat broader than prothorax; membrane yellowish, plates brown. Wings long, very slen-

der, overreaching the abdomen; fore wings about eighteen times as long as width at middle, of normal venation; costal margin with about 20 bristles; principal vein with four colorless bristles, of which two are near base and two near fork; anterior vein with one bristle near base and two near apex, all slender, the last brownish; posterior vein with six or seven usually equidistant bristles, all long and slender, colorless; fore wings nearly white, with a short, dark band at fork of veins connected with one at apex by a narrow line of brown extending along the extreme posterior margin and hooked forward in apical twelfth (where it is darkest) along anterior margin; hind wings brownish, with darker median vein.

Abdomen moderately slender, ovate, pointed at tip; notum subreticulate, more faintly at middle; segment 10 with longitudinal dorsal suture.

Measurements of holotype: Length 1.08 mm.; head, length 0.126 mm., width 0.156 mm.; prothorax, length 0.120 mm., width 0.206 mm.; mesothorax, width 0.259 mm.; metathorax, width 0.240 mm.; abdomen, width 0.300 mm. Antennal segments: 1, 18 μ ; 2, 39 μ ; 3, 48 μ ; 4, 44 μ ; 5, 34 μ ; 6, 27 μ ; 7, 18 μ ; 8, 33 μ ; total length of antenna, 0.26 mm.; width at segment 4, 0.023 mm.

Described from three females taken by Mr. Hart in sweepings, at Monterey, Mexico, July 5, 1908.

This species, also, is related to the group of which *fasciatus* is typical. The wing coloration is distinctive.

***Heliothrips cinctipennis*, new species.**

Female.—Length about 1.2 mm. General color yellowish brown to nearly black, with head and thorax much paler than abdomen, the latter with last three segments distinctly paler; legs yellow, with the fore femora at base, and the middle and posterior femora and all tibiae, at middle, shaded with brownish; antennae pale, segments 1, 2, and 6-8, nearly concolorous with body, intermediate segments nearly white, slightly clouded with brown toward apex.

Head about 1.2 times as wide as long, distinctly longer than prothorax; cheeks subparallel, arcuate; dorsal surface conspicuously reticulate, more coarsely toward base; frontal costa nearly as wide as first antennal segment. Eyes distinctly longer than their distance from posterior margin of head, slightly prominent, setose. Ocelli of normal form and position. Antennae usually a little less than twice as long as head; segment 1 subquadrate; 2 broadest in entire antenna, a little longer than wide; 3 and 4 urn-shaped, the former slightly more than twice as long as wide; 5 egg-shaped, pedicellate; 6 and 7 together of same form as 5, but inverted; 8 very long and slender; segments 1, 2, and 6-8, brown, the first paler; intermediate segments pale brownish yellow, slightly clouded with gray in apical portion. Maxillary palpi two-segmented.

Prothorax about 1.9 times as wide as long, distinctly shorter than head and with similar reticulation; bristles few, short, well distributed, a more prominent pair near middle of anterior margin. Pterothorax somewhat

broader than prothorax; membrane yellowish, plates brown. Wings long, very slender, overreaching abdomen; fore wings about eighteen times as long as width at middle, of normal venation; costal margin with about 18 bristles; principal vein with four short colorless bristles, of which two are near base and two near fork; anterior vein with one bristle at base and two near apex, all slender, the last longer and brownish; posterior vein with four or five nearly equidistant bristles, these usually rather short, colorless; fore wings white, with a dark brown or black band occupying the second and third fourths, margined with darker brown in apical eighth, extreme base lightly washed with brown; hind wings brownish, with darker median vein.

Abdomen moderately slender, ovate, pointed at tip; notum subreticulate, more faintly at middle; segment 10 with longitudinal dorsal suture.

Measurements of holotype: Length 1.16 mm.; head, length 0.133 mm., width 0.161 mm.; prothorax, length 0.109 mm., width 0.212 mm.; mesothorax, width 0.248 mm.; metathorax, width 0.224 mm.; abdomen, width 0.300 mm. Antennal segments: 1, 18 μ ; 2, 37 μ ; 3, 45 μ ; 4, 40 μ ; 5, 38 μ ; 6, 33 μ ; 7, 14 μ ; 8, 33 μ ; total length of antenna, 0.26 mm., width at segment 4, 0.021 mm.

Male.—Length about 0.8 mm. Sternum of abdominal segments 3-7 each with a nearly circular pale area. Segment 9 with two pairs of dorsal spines, the basal pair much shorter and stouter than the apical.

Described from 25 females and 4 males, from Anna, Clay City, Grand Tower, Havana, Hillery, and Makanda, Illinois, all taken by Mr. Hart in sweepings from grass and weeds, during June, July, August, and September.

In the specimens at hand the coloration of the body, wings, and antennæ is remarkably constant, and serves to distinguish the species from the allied *H. fasciapennis* (sic!) Hinds. In the latter species, furthermore, the pale areas on the ventral surface of the male abdomen are fully five times as wide as long, instead of transversely oval or nearly circular.

Thrips pallicornis, new species. (Pl. v, figs. 5, 6.)

Female.—Length about 1.2 mm. Color dark blackish brown or black, with bright crimson hypodermal pigmentation, more brilliant in pterothorax and second antennal segment; segments 3-7 pale lemon-yellow, slightly shaded with gray; wings of fore pair white in basal fourth, remainder blackish brown.

Head 1.4 times as wide as median dorsal length, somewhat longer than prothorax, as broad across eyes as midway between eyes and base; checks arcuate to eyes and base of head; vertex rather depressed, frontal costa notched at about 60°; four pairs of very distinct bristles behind eyes, and another similar pair between anterior and posterior ocelli; a small pair lateral to and in front of the anterior ocellus. Eyes rather less than half

as long as head, prominent, protruding, noticeably pilose. Ocelli normal, opposite about middle of eyes. Antennæ long, more than twice the length of head, unusually slender, form and structure well shown in figure (Pl. v, fig. 6); segments 1 and 2 concolorous with head, the latter segment, however, with dense crimson pigment; remainder of antenna yellow, with base of third and, to a less degree, of fourth to sixth and all of seventh, usually shaded with gray. Maxillary palpi three-segmented.

Prothorax about 1.5 times as wide as long, without evident sculpture, sides gently rounded; two pairs of long, slender bristles at posterior angles. Wings of fore pair about fourteen times as long as wide, white in basal fourth, remainder blackish brown; costal margin with about 25 spines; anterior vein with 10 spines, of which seven are nearly confined to the white band (not passing basal $4/11$ of wing), the remaining three at $7/11$, $9/11$, and a little more than $10/11$ beyond base of wing, respectively; posterior vein also with about 10 spines, the first of which is usually exactly behind the last spine in the basal series of the anterior vein, and the last of which is opposite a point nearly midway between the last two on the anterior vein. Legs concolorous with body, rather conspicuously set with stout, dark bristles.

Abdomen of normal form, with tenth segment longitudinally sulcate above in at least apical half; bristles on segments 9 and 10 long, stout, nearly black.

Measurements of holotype: Length 1.24 mm.; head, length 0.144 mm., width 0.163 mm.; prothorax, length 0.132 mm., width 0.193 mm.; mesothorax, width 0.276 mm.; metathorax, width 0.246 mm.; abdomen, width 0.282 mm. Antennal segments: 1, 30 μ ; 2, 42 μ ; 3, 64 μ ; 4, 54 μ ; 5, 48 μ ; 6, 58 μ ; 7, 22 μ ; total length of antenna, 0.32 mm., width at segment 4, 0.019 mm.

Male.—Length about 1 mm. Similar in color and general structure to female. Segment 9 above with a pair of short, slender bristles at apical third near lateral margin, and with four larger bristles—apical, equidistant, and subparallel—lying closely above suranal plate; the latter with four slender bristles at apical third, the median pair longer; lateral, subapical bristles of segments 9 and 10 long, dark, moderately conspicuous.

Measurements of allotype: Length 0.98 mm.; head, length 0.127 mm., width 0.144 mm.; prothorax, length 0.102 mm., width 0.167 mm.; mesothorax, width 0.223 mm.; metathorax, width 0.192 mm.; abdomen, width 0.164 mm. Antennal segments: 1, 29 μ ; 2, 38 μ ; 3, 60 μ ; 4, 51 μ ; 5, 41 μ ; 6, 58 μ ; 7, 20 μ ; total length of antenna, 0.30 mm., width at segment 4, 0.018 mm.

Described from 17 females and 4 males, all from Illinois, as follows: Carbondale, September 19, 1908, L. M. Smith, 1 male; Clay City, September 2, 1909, C. A. Hart, 2 females; Dubois, April 28 and September 17, 1908, July 3, 1909, C. A. H., L. M. S., 12 females, 3 males; Herrin, May 12, 1909, L. M. S., 1 female; Olney, May 4, 1909, L. M. S., 1 female;

Parker, July 14, 1909, C. A. H., 1 female. All specimens, with the exception of the single female from Olney, which was taken on an apple leaf, were found on the under surface of hickory leaves, sometimes in abundance.

Type locality: Parker, Illinois.

The antennal coloration is distinctive. Superficially the species bears a close resemblance to *Baliothrips basalis* Shull.

SUBORDER TUBULIFERA HALIDAY.

FAMILY PHLEOTHRIPIDÆ UZEL.

Zygothrips pallidus, new species. (Pl. VI, figs. 1, 2.)

Female (forma brachyptera).—Length about 1.6 mm. Color clear, bright lemon-yellow, with antennal segments 7 and 8 shaded with brown, and apical three-fourths of tube abruptly nearly black. (By reflected light the legs and antennæ appear darker, due to the absence therefrom of the yellow hypodermal pigment, which is very dense in the other regions of the body.)

Head about 1.4 times as long as wide, very slightly broadest at basal fourth, thence evenly narrowing to eyes and base; vertex elevated, almost overhanging, evenly declivous; dorsal and lateral surfaces without sculpture, the spines few and very inconspicuous; postocular bristles short, two-thirds as long as eyes, blunt but not capitate. Eyes about one-third as long as head, slightly protruding, nearly prominent. Anterior ocellus scarcely overhanging, the posterior pair opposite anterior third of eyes. Antennæ slightly more than one and one-half times as long as head, rather stout; segment 1 nearly as broad at base as long; 2 stout, globose; 3 much narrower than 2, stout, swollen just beyond the abrupt pedicel; 4 clavate, longest in entire antenna, nearly as stout as 2; 5-7 clavate, successively decreasing in length and breadth; 8 conical, twice as long as wide, more than two-thirds as wide at base as apex of 7; sense cones short, weak, transparent, barely visible. Mouth cone blunt, much shorter than width of head, reaching about to middle of prosternum; labrum not attaining labium.

Prothorax about as long as width of head and (inclusive of coxæ) about one and two-thirds times as wide as long; surface smooth; anterior marginal and midlateral bristles wanting, others short and blunt (scarcely capitate), the two pairs near the posterior angles subequal in length and longest; coxal bristle similar to and nearly as long as the latter. Pterothorax slightly wider than prothorax, sides nearly straight and parallel. Legs rather stout, of moderate length; fore tarsi armed with a very small, acute tooth; color lemon-yellow, without shading even on femora.

Abdomen (greatly distended in the type) of apparently normal form. Tube about half as long as head, less than twice as long as basal width, and about half as wide at apex as at base; terminal bristles brown, very slightly longer than tube; all other abdominal bristles clear yellow.

Measurements of holotype: Length 1.56 mm.; head, length 0.252 mm., width 0.180 mm.; prothorax, length 0.180 mm., width (inclusive of coxæ) 0.300 mm.; pterothorax, width 0.312 mm.; abdomen, width 0.360 mm.; tube, length 0.120 mm., width at base 0.073 mm., at apex 0.038 mm. Antennal segments: 1, 44 μ by 41 μ ; 2, 53 μ by 35 μ ; 3, 51 μ by 31 μ ; 4, 62 μ by 35 μ ; 5, 57 μ by 30 μ ; 6, 53 μ by 27 μ ; 7, 48 μ by 24 μ ; 8, 27 μ by 13 μ ; total length of antenna, 0.39 mm.

Male.— Much smaller than female; length about 1 mm. Color luteous, shaded with gray on femora, tibiæ, segments 4–8 of antennæ, and apical three-fourths of tube. Ocelli apparently wanting. Prothoracic bristles rather more capitate than blunt. Abdomen slender. Otherwise similar to female.

Described from 1 female (holotype) from Brownsville, Texas, taken December 8, 1910, in sweepings from Bermuda grass; and 1 male (allotype) from Padre Island, Texas (opposite Point Isabel), taken June 28, 1908, "in sweepings from grass, etc." Both specimens were taken by Mr. Hart.

The coloration of this species is remarkable, as is also the structure of the third antennal segment.

It will be noticed that the two illustrations given herewith are unfortunately of the male, for the reason that the female was not known until two years after the execution of the drawings.

Genus RHYNCHOTHRIPS nov.

(ῥύγχος, beak; θρῦψ, a wood worm.)

Head little, if any, longer than broad, about equal in length to prothorax; cheeks finely roughened, without spiniferous tubercles. Antennæ eight-segmented, the last two segments closely united. Eyes one-third or one-fourth as long as head. Ocelli placed far forward, the median one overhanging, sometimes borne at tip of slightly produced vertex. Mouth cone unusually long and slender, fully as long as dorsum of head, attaining or surpassing front margin of mesosternum; labrum very acute, elongate, sometimes one and one-third times as long as width of head. Prothorax large, heavy, nearly or quite as long as head, with median dorsal thickening; anterior and posterior margins concentric. Fore tarsi usually unarmed. Wings, when present, of nearly equal width throughout. Abdomen broad and heavy, with short bristles.

Type: Rhynchothrips pruni, new species.

This genus will also embrace *Trichothrips tridentatus* Shull and *T. buffæ* Hood. The very long mouth cone and the large, heavy prothorax are distinctive. Though two of its species were described in *Trichothrips*, it appears to be much more closely related to *Liothrips*. All the known species occur under

the loose scales of bark on living trees, and the peculiar mouth-parts appear to be an adaptation to such a life.

Rhynchothrips pruni, new species. (Pl. VI, fig. 4.)

Female (forma brachyptera).—Length about 1.5 mm. Color nearly black, thorax paler; tarsi, articulations of legs, and at least the basal portions of antennal segments 1-6, ochreous.

Head as wide as long, broadest somewhat behind eyes; cheeks slightly converging posteriorly, rounded rather abruptly to eyes and gently to base of head; lateral and dorsal surfaces noticeably transversely striate, sparsely, briefly, and scarcely visibly spinose; vertex slightly rounded in front; postocular bristles pointed, equal in length to eyes. Eyes one-fourth as long as head, subcircular as seen from above. Ocelli small, situated far forward; anterior ocellus well down on vertex, overhanging; posterior ocelli situated near anterior angles of eyes. Antennæ stout, slightly more than twice as long as head, faintly subreticulate; segment 1 slightly broader than long; 2 swollen, 1.5 times as long as wide; 3 swollen, clavate, scarcely twice as long as wide, pedicel one-fourth of greatest width; 4-6 subglobose, pedicellate, less than 1.5 times as long as wide, 4 broadest, 6 with sides less rounded apically; 7 oblong, pedicellate, truncate at apex and broadly united to 8, which is conical, not narrowed at base, and twice as long as wide; antennæ bright ochre in first two segments, becoming gradually darker toward apex, 7 and 8 being concolorous with body. Sense cones of moderate length, slender; formula: 3, 0-1; 4, 1-1; 5, 1-1⁺; 6, 1-1⁺; 7 with one on dorsum near apex. Mouth cone very long, slender, fully as long as dorsum of head, surpassing base of prosternum; labrum surpassing labium.

Prothorax slightly longer than head and (inclusive of coxæ) only 1.7 times as wide as long; pronotum with short, median thickening; all spines present, pointed, only the pair at posterior angles long. Pterothorax slightly wider than prothorax, sides straight, slightly diverging posteriorly. Legs short and stout, the fore femora shorter than head; fore tarsi unarmed.

Abdomen large, broad, about 1.4 times as wide as prothorax, narrowing roundly from about segment 4 to base of tube. Tube about 0.9 as long as head, less than twice as long as basal width, and fully twice as wide at base as at apex, sides straight. Bristles pointed, brown; lateral bristles on segment 9 subequal to terminal bristles, equal in length to tube.

Measurements of holotype: Length 1.55 mm.; head, length 0.162 mm., width 0.163 mm.; prothorax, length 0.175 mm., width (inclusive of coxæ) 0.296 mm.; pterothorax, width 0.318 mm.; abdomen, width 0.426 mm.; tube, length 0.148 mm., width at base 0.081 mm., at apex 0.035 mm. Antennal segments: 1, 27 μ ; 2, 50 μ ; 3, 54 μ ; 4, 46 μ ; 5, 48 μ ; 6, 48 μ ; 7, 49 μ ; 8, 32 μ ; total length of antenna, 0.36 mm., width at segment 4, 0.033 mm.

Male.—Slightly smaller than female, with more slender abdomen; fore tarsi unarmed.

Described from 4 females and 9 males, from Carbondale, Pulaski, Riverside, and Urbana, Illinois, taken in May, June, July, September, and October, by L. M. Smith, C. A. Hart, and the writer. It occurs commonly under the loose scales of the bark on wild cherry, though taken occasionally from peach and sycamore.

It is closely related to the species described by me as *Trichothrips buffæ*, but the smaller size, longer, stouter prothorax, wider head, and stouter, differently colored antennæ, should distinguish it at once. Franklin's record¹ of the latter insect for St. Anthony Park, Minnesota, may possibly refer to the present species.

Rhynchothrips dentifer, new species. (Pl. VI, fig. 3.)

Female (forma macroptera).—Length about 1.5 mm. Color dark blackish brown, nearly black; tarsi and intermediate antennal segments paler.

Head slightly longer than wide, narrowest across eyes; cheeks subparallel, roundly converging to eyes from middle, base with an abrupt but slight collar-like widening; lateral and dorsal surfaces noticeably transversely striate, sparsely, briefly, and scarcely visibly spinose; vertex slightly rounded in front; postocular bristles truncate and slightly dilated at tip, equal in length to eyes. Eyes one-third as long as head, slightly longitudinally elongate as seen from above. Ocelli moderately small, situated far forward; anterior ocellus overhanging; posterior ocelli opposite anterior third of eyes. Antennæ stout, slightly more than twice as long as head, scarcely subreticulate; segment 1 scarcely broader than long; 2 rather stout, about 1.5 times as long as wide; 3 stout, clavate, about twice as long as wide; 4-6 oval, pedicellate, 1.66 times as long as wide, 4 broadest; 7 narrowed apically, pedicellate, about twice as long as wide, truncate at apex and broadly united to 8, which is sharply conical, not narrowed at base, and twice as long as wide; segments 1 and 2 nearly concolorous with body, 2 paler toward apex; 3 brownish yellow, shaded with brown at sides and in apical two-thirds; 4, 5, and 6 successively darker, with pale pedicels; 7 and 8 concolorous with body. Sense cones of moderate length, slender; segment 3 with one on outer surface; 4 with one on inner surface, two on outer, and a rudimentary one on dorsum near apex; 5 and 6 with one fully developed cone on each side and an additional rudimentary subapical one; 7 with the usual long, dorsal cone near apex. Mouth cone very slender, excessively long, fully a fifth longer than dorsum of head, reaching half across mesosternum; labrum greatly surpassing labium.

Prothorax very slightly shorter than head and (inclusive of coxæ) about 1.8 times as wide as median length of pronotum, the latter with short median thickening; all spines present, dilated and truncate at tip, the two pairs along posterior margin subequal and somewhat the longest. Ptero-

¹ Ent. News, Vol. XX, No. 5, p. 231.

thorax broader than prothorax, sides nearly straight and converging posteriorly. Wings apparently broad, of equal width throughout, slightly clouded with brownish at middle. Legs of medium length, the fore femora equal in length to head; fore tarsi armed with a short, stout tooth placed at right angles to the tarsus.

Abdomen large, broad, nearly 1.4 times as wide as prothorax, narrowing roundly from about segment 4 to base of tube. Tube nearly as long as head, slightly more than twice as long as basal width, and fully twice as wide at base as at apex, slightly contracted at both base and apex. Lateral bristles dilated and rather short, excepting for one pair each on segments 7 and 9 which are pointed and nearly as long as tube; terminal bristles about equal in length to tube, brown.

Measurements of holotype: Length 1.45 mm.; head, length 0.185 mm., width 0.172 mm.; prothorax, length 0.168 mm., width (inclusive of coxæ) 0.311 mm.; pterothorax, width 0.360 mm.; abdomen, width 0.420 mm.; tube, length 0.172 mm., width at base 0.075 mm., at apex 0.035 mm. Antennal segments: 1, 30 μ ; 2, 52 μ ; 3, 54 μ ; 4, 57 μ ; 5, 55 μ ; 6, 52 μ ; 7, 51 μ ; 8, 30 μ ; total length of antenna, 0.38 mm.; width at segment 4, 0.034 mm.

Female (forma brachyptera).—Apparently identical with the long winged form, with the exception of the narrower pterothorax, which is equal in width to prothorax. Abdominal segments 7 and 9 each with a pair of long, pointed, lateral bristles, as described for the macropterous form.

Described from two females taken by the writer near Baldwin, Michigan, under loose bark on a freshly-cut poplar stump, August 16 and 17, 1908.

The remarkably long mouth cone and the armed fore tarsi render this species very distinct.

Genus PHLEOTHRIPS Haliday.

1836. *Phleothrips* (sic!) Haliday, Ent. Mag., vol. III, p. 441.
 1895. *Phleothrips* Uzel, Monogr. d. Ordn. Thys., p. 254.
 1899. *Phleothrips* Reuter, Acta Soc. pro Fauna et Flora Fennica, vol. XVII, No. 2, p. 18.
 1902. *Phleothrips* Hinds, Proc. U. S. Nat. Mus., vol. XXVI, p. 195.
 1912. *Phleothrips* Jones, Tech. Ser. 23, pt. I, Bur. Ent., U. S. Dept. Agr., p. 21. (Gives key to North American species.)

The species *coriaceus* of Haliday must be considered the type of this genus, for it is the only recognizable one known to Haliday which has not been removed or reduced to synonymy. Its North American components—with the exception of *virgatus* and *maculatus*—form a homogeneous group remarkable for the structure of the fore leg of the male, the femur having two acute teeth on the inner side near the apex, between which when the leg is flexed, fits a similar tibial tooth. This structure is constant in more than a dozen species known to me,

and entitles them to rank as a distinct subgenus, which may be distinguished from *Phlæothrips* spp. as follows:

Subgenus HOPLANDROTHRIPS nov.

Dorsal surface, at least of pronotum, not deeply roughened. Vertex subconical, more or less produced. Genal spines not directed anteriorly from the apices of prominent tubercles. Prothorax evenly trapezoidal, with straight sides; bristles long, normal in position. Femur of male with two subapical teeth on inner side; tibia of male with a similar tooth near base.

Type: Phlæothrips (Hoplandrothrips) xanthopus, new species.

Bagnall's *Acanthothrips bidens* almost certainly belongs here, if it is not the original *Hoplothrips corticis* Amyot and Serville. In the latter event *Hoplothrips* will, of course, have priority over *Hoplandrothrips*.

Phlæothrips (Hoplandrothrips) xanthopus, new species. (Pl. VI, figs. 6, 7a, b.)

Female (macropterous).—Length about 1.7 mm. General color light blackish brown, with scattered maroon hypodermal pigmentation in head, thorax, and abdomen, exclusive of tube; tibiæ, tarsi, bases of intermediate antennal segments, and middle of abdomen, lemon-yellow.

Head 1.3 times as long as wide, broadest at middle; cheeks rounded abruptly to eyes and gently to near base, thence slightly diverging, forming a neck-like constriction, which is equal in width to greatest distance across eyes, or to about 0.9 greatest width of head; lateral surfaces roughened with rather deep, anastomosing lines, each cheek with about three rather stout, dark bristles arising from short tubercles; vertex subconical, produced, overhanging; postocular bristles alone prominent, equal in length to eyes, dilated and truncate at tip. Eyes about one-third as long as head, their axis of greatest dorsal length nearly coinciding with a line drawn from base of first antennal segment to anterior end of gena. Ocelli of moderate size, equidistant; anterior ocellus borne at apex of produced vertex, posterior ocelli distinctly in advance of middle of eyes. Antennæ 1.6 times as long as head, slender; segment 1 trapezoidal, broader than long; 2 about 1.75 times as long as broad; 3 clavate, twice as long as wide, deeply sinuate on inner side, pedicel curved outward; 4 clavate, narrowed at apex, equal in width to 3, broadest slightly in advance of middle, twice as long as wide; 5-7 truncate-fusiform, little wider at apex than at base, successively decreasing in length and width, 7 about 2.5 times as long as wide; 8 subconical, truncate and slightly narrowed at base; segments 1 and 2 concolorous with body; 3 yellow, clouded with brown at middle; 4-6 yellow, indefinitely shaded with brown in apical half or two-thirds; 7 and 8 brown, the pedicel of former pale. Sense cones large, fully a third as long as segment 3; formula: 3, 1-2; 4, 2-2; 5, 1-1⁺; 6, 1-1⁺; 7 with one on dorsum

near apex. Mouth cone slender, nearly attaining mesosternum; labium broadly rounded at tip, slightly surpassed by labrum.

Prothorax somewhat more than half as long as head and (inclusive of coxæ) about 2.2 times as wide as long; pronotum non-sculptured, anterior and posterior margins concentric; all usual bristles present, subequal, dilated at tip, and about as long as postoculars. Pterothorax slightly wider than prothorax, sides straight and converging posteriorly. Wings present. Legs moderately slender; fore tarsus with a short, stout, acute tooth.

Abdomen little, if any, broader than pterothorax, broadest toward base, thence rounded gradually to base of tube. Tube about 0.6 as long as head, about 2.3 times as long as basal width, and twice as wide at base as at apex, sides straight. Lateral bristles of moderate length, knobbed, yellowish, two pointed pairs at apex of segment 9 longer; terminal bristles about 1.5 times as long as tube, brown.

Measurements of holotype: Length 1.68 mm.; head, length 0.276 mm., width 0.212 mm.; prothorax, length 0.154 mm., width (inclusive of coxæ) 0.341 mm.; mesothorax, width across fore margin 0.360 mm.; metathorax, width across hind margin 0.312 mm.; abdomen, width 0.360 mm.; tube, length 0.172 mm., width at base 0.075 mm., at apex 0.039 mm. Antennal segments: 1, 30 μ ; 2, 54 μ ; 3, 76 μ ; 4, 70 μ ; 5, 63 μ ; 6, 57 μ ; 7, 52 μ ; 8, 34 μ ; total length of antenna, 0.44 mm.; width at segment 4, 0.033 mm.

Described from 5 females, as follows: Pulaski, Illinois, C. A. Hart, May 28, 1909, in sweepings from grass; Pulaski, Illinois, July 24, 1909, C. A. H., in woodland sweepings; St. Joseph, Illinois, May 4, 1907, C. A. H. and J. D. H., at base of mullein leaves; Urbana, Illinois, January 26, 1908, J. D. H., under bark of soft maple tree; "Millerstown, Pa., Sept. 6, on fox grape." (Pa. State Dept. Agr., Div. Zool., No. 3668).

Two males, both from Illinois, appear to belong with this species, but show so much mutual variation in the form of the fore legs that I have hesitated to include either in this preliminary description. The species bears a resemblance to Hinds's *uzeli*, but is easily separable by the much shorter tube (which is not more than 0.6 as long as the head, instead of nearly 0.8) and the longer, slenderer, and less abruptly sinuate, third segment of the antenna, which in *uzeli* is not more than 1.7 times as long as wide. This latter difference is illustrated in the accompanying figures (Pl. vi, figs. 5 and 6).

Phlæothrips (Hoplandrothrips) juniperinus, new species. (Pl. VII, figs. 5, 6.)

Female (macropterous).—Length about 1.5 mm. General color dark blackish brown, with a rather dense, nearly continuous layer of maroon hypodermal pigmentation in head, thorax, and abdomen, inclusive of tube; antennæ with basal two-thirds of segment 3, basal third of segment 4, and pedicel of 5, yellow.

Head not more than 1.2 (1.14 to 1.20) times as long as wide, broadest at middle; cheeks rounded abruptly to eyes and gently to near base, thence slightly diverging, forming a neck-like constriction which is about equal in width to greatest distance across eyes, or to about 0.9 the greatest width of head; lateral and dorsal surfaces very slightly roughened with shallow, anastomosing lines, each cheek with about three rather stout, dark bristles arising from short tubercles; vertex subconical, produced, overhanging; postocular bristles alone prominent, shorter than eyes, very slightly dilated and truncate at tip. Eyes about one-third as long as head, their axis of greatest dorsal length nearly coinciding with a line drawn from base of first antennal segment to anterior end of gena. Ocelli of moderate size, equidistant; anterior ocellus borne at apex of produced vertex, posterior ocelli distinctly in advance of middle of eyes. Antennæ 1.6 times as long as head, moderately slender; segment 1 trapezoidal, broader than long; 2 about 1.5 times as long as broad; 3 clavate, twice as long as wide, deeply sinuate on inner side, pedicel curved outward; 4 clavate, narrowed at apex, equal in width to 3, broadest slightly in advance of middle, twice as long as wide; 5 shorter and narrower than 4, of similar form but with straighter sides, pedicel three-fifths of apical width; 6 and 7 oblong, pedicellate, truncate at apex, apical breadth fully twice that of pedicel, 7 about one and one-half times as long as wide; 8 subconical, truncate and slightly narrowed at base. Sense cones of medium size, those on segment 3 about one-third the length of segment; formula: 3, 1-2; 4, 2-2; 5, 1-1⁺; 6, 1-1⁺; 7 with one on dorsum near apex. Mouth cone slender, nearly attaining mesosternum; labium broadly rounded at tip, slightly surpassed by labrum.

Prothorax somewhat more than half as long as head and (inclusive of coxæ) about 2.41 times as wide as long; pronotum non-sculptured, anterior and posterior margins concentric; all usual bristles present, short, dilated and truncate at tip, those on anterior margin about half as long as postoculars, distinctly shorter than the pair at the posterior angles, often pointed. Pterothorax slightly wider than prothorax, sides straight and converging posteriorly. Wings of fore pair colorless, distinctly broader in basal than in apical half, slightly narrowed at middle, not closely fringed (the posterior margin with only about 52 hairs), subapical fringe double for about nine hairs. Legs rather stout; fore tarsus with a short, stout, acute tooth.

Abdomen little, if any, broader than pterothorax, broadest toward base, thence rounded gradually to base of tube. Tube about 0.6 as long as head, about twice as long as basal width, and twice as wide at base as at apex, sides straight. Lateral bristles of moderate length, knobbed, yellowish, two pointed pairs at apex of segment 9 longer; terminal bristles about as long as tube, brown.

Measurements of holotype: Length 1.50 mm.; head, length 0.252 mm., width 0.215 mm.; prothorax, length 0.128 mm., width (inclusive of coxæ) 0.310 mm.; mesothorax, width across fore margin 0.342 mm.; metathorax, width across hind margin 0.280 mm.; abdomen, width 0.350 mm.; tube,

length 0.150 mm., width at base 0.072 mm., at apex 0.036 mm. Antennal segments: 1, 30 μ ; 2, 51 μ ; 3, 72 μ ; 4, 66 μ ; 5, 61 μ ; 6, 51 μ ; 7, 40 μ ; 8, 29 μ ; total length of antenna, 0.40 mm., width at segment 4, 0.035 mm.

Male.—Length about 1.3 mm. Head longer than in female, about 1.3 times as long as wide. Fore femora and tibiae swollen; tarsal tooth stronger. Prothoracic and postocular bristles much longer than in female, the pair at the anterior angles subequal in length to postoculars, which are fully as long as eyes.

Described from 4 females and 2 males, taken by the writer from branches of red cedar (*Juniperus virginiana* L.), on Plummer's Island, Maryland (in the Potomac River near Washington, D. C.), May 19, 1912.

The coloration of the antennae, taken in conjunction with their structure and the form of the head, would seem to indicate a very distinct species. It belongs, however, to a group in which specific separation is largely opinionative.

Phlœothrips (Hoplandrothrips) funebris, new species. (Pl. VII, figs. 1-4.)

Female (macropterous).—Length about 1.4 mm. Color uniform dark-blackish brown, tarsi and apices of fore tibiae yellowish; maroon hypodermal pigmentation nearly continuous in head, thorax, and abdomen, inclusive of tube.

Head about 1.2 times as long as wide, broadest at middle; cheeks rounded abruptly to eyes and gently to near base, thence slightly diverging, forming a neck-like constriction which is equal in width to greatest distance across eyes, or to about 0.9 greatest width of head; lateral surfaces very slightly roughened with shallow, anastomosing lines, each cheek with about three rather stout, dark bristles arising from short tubercles; vertex subconical, produced, overhanging; postocular bristles alone prominent, equal in length to eyes, dilated and truncate at tip. Eyes about one-third as long as head, their axis of greatest dorsal length nearly coinciding with a line drawn from base of first antennal segment to anterior end of gena. Ocelli of moderate size, equidistant; anterior ocellus borne at apex of produced vertex, posterior ocelli distinctly in advance of middle of eyes. Antennae 1.6 times as long as head, moderately slender; segment 1 trapezoidal, broader than long; 2 about 1.7 times as long as broad; 3 clavate, swollen apically, scarcely more than 1.7 times as long as wide, not deeply sinuate on inner side, pedicel not curved outward; 4 clavate, swollen, narrowed at apex, often narrower than 3, broadest slightly in advance of middle, 1.7 times as long as wide; 5 not swollen, rather abruptly narrower than 4, broadest at middle; 6 and 7 oblong, pedicellate, truncate at apex, apical breadth about twice that of pedicel, 6 broadest at middle, 7 broadest behind middle and about twice as long as wide; 8 subconical, truncate and slightly narrowed at base. Sense cones large, those on segment 3 one-half the length of segment; formula: 3, 1-2; 4, 2-2; 5, 1-1⁺; 6, 1-1⁺;

7 with one on dorsum near apex. Mouth cone slender, nearly attaining mesosternum; labium broadly rounded at tip, slightly surpassed by labrum.

Prothorax somewhat more than half as long as head and (inclusive of coxæ) about 2.4 times as wide as long; pronotum non-sculptured, anterior and posterior margins concentric; all usual bristles present, subequal and dilated at tip, about as long as postoculars. Pterothorax usually slightly wider than prothorax, sides straight and converging posteriorly. Wings more or less clouded with brown, distinctly broader in basal than in apical half, slightly narrowed at middle, not closely fringed (the posterior margin with only about 52 hairs), subapical fringe double for about nine hairs. Legs rather stout; fore tarsus with a short, stout, acute tooth.

Abdomen little, if any, broader than pterothorax, broadest toward base, thence rounded gradually to base of tube. Tube about half as long as head, about twice as long as basal width, and slightly less than twice as wide at base as at apex, sides straight. Lateral bristles long, three-fifths the length of tube, knobbed, yellowish, two pointed pairs at apex of segment 9 longer; terminal bristles about 1.5 times as long as tube, brown.

Measurements of holotype: Length 1.38 mm.; head, length 0.228 mm., width 0.197 mm.; prothorax, length 0.124 mm., width (inclusive of coxæ) 0.292 mm.; mesothorax, width at anterior margin 0.292 mm.; metathorax, width at posterior margin 0.246 mm.; abdomen, width 0.300 mm.; tube, length 0.120 mm., width at base 0.056 mm., at apex 0.036 mm. Antennal segments: 1, 24 μ ; 2, 48 μ ; 3, 54 μ ; 4, 57 μ ; 5, 51 μ ; 6, 47 μ ; 7, 42 μ ; 8, 29 μ ; total length of antenna, 0.35 mm., width at segment 4, 0.033 mm.

Male.—Length about 1.3 mm. Head very slightly, if any, longer than in female. Fore femora and tibiae swollen; tarsal tooth stronger. Prothoracic and postocular bristles longer than in female, the pair at the anterior angles unusually long, much longer than the eyes.

Described from 14 females and 1 male, as follows:—Illinois: Carbondale, October 12 and 15, 1908, L. M. Smith, on branches of sycamore and post oak (*Quercus stellata* Wang.); Anna, October 26, 1908, L. M. S., on branch of sycamore; Monticello, August 1, 1908, C. A. Hart, on branch of willow birch; Pulaski, October 27 and 28, 1908, L. M. S., on branch of white oak (*Quercus alba* L.) and swamp oak (*Q. palustris* Muench.). Missouri: Wittenberg, July 12, 1909, C. A. H., on branch of walnut. Maryland: Plummer's Island (in the Potomac River near Washington, D. C.), May 19, 1912, W. L. McAtee and J. D. H., on branch of *Quercus* sp. District of Columbia: Washington, July 28, 1912, J. D. H., on branch of yellow locust (*Robinia pseudacacia* L.).

Type locality: Carbondale, Illinois.

This species is one of the commonest and most widely distributed ones of the genus. Mr. A. C. Morgan has shown me a specimen from Florida, in the collection of the Bureau of

Entomology. The coloration of the antennæ is very constant and characteristic, as is also the form of the third antennal segment. Rarely the lower and outer margins of all the intermediate segments are slightly paler and of a yellowish brown color.

Phlœothrips (Hoplandrothrips) microps, new species. (Pl. VII, figs. 7, 8.)

Female (forma macroptera).—Length about 1.6 mm. General color dark blackish brown, with a rather dense, nearly continuous layer of maroon hypodermal pigmentation in head, thorax, and abdomen, inclusive of tube; antennæ with basal half of segment 3 yellow, and pedicels of 4-6 yellow or gray.

Head about 1.2 times as long as wide, fully twice as long as prothorax; cheeks very slightly arched, subparallel, converging roundly and rather abruptly to eyes and rather slightly to base, which is about a tenth broader than greatest distance across eyes and without evident neck-like constriction; lateral surfaces very slightly roughened with shallow, anastomosing lines, each cheek with about six rather stout, dark bristles arising from short tubercles; vertex rounded, scarcely conical, produced, overhanging; postocular bristles distinctly longer than eyes, dilated and truncate at tip; dorsum with a pair of long accessory bristles nearly equal in length to postoculars and of similar form, situated midway between posterior margin of eyes and base of head. Eyes very slightly less than one-fourth as long as head, subcircular as seen from above. Ocelli of moderate size, equidistant, anterior ocellus borne at tip of vertex, posterior ocelli opposite or behind centers of eyes. Antennæ nearly 1.6 times as long as head, slender; segment 1 trapezoidal, broader than long; 2 nearly twice as long as broad; 3 clavate, 2.4 times as long as greatest width, deeply sinuate on inner side, pedicel curved outward; 4 clavate, slightly wider than 3, fully twice as long as broad, widest at apical third; 5 shorter and narrower than 4, of nearly similar form, but with shorter pedicel and straighter sides, pedicel four-fifths of apical width; 6 and 7 oblong, pedicellate, truncate at apex, apical breadth fully twice that of pedicels, 6 broadest toward apex, 7 broadest toward base and about twice as long as wide; 8 conical, truncate, not narrowed at base, broadly united to 7. Sense cones short, those on segment 3 about one-fourth the length of segment; formula: 3, 1-1; 4, 1-2; 5, 1-1⁺; 6, 1-1⁺; 7 with one on dorsum near apex. Mouth cone slender, nearly attaining mesosternum; labium broadly rounded at tip, slightly surpassed by labrum.

Prothorax not more than half as long as head and (inclusive of coxæ) about 2.5 times as wide as long; pronotum non-sculptured, anterior margin roundly subangulate at middle; all usual bristles present, slightly dilated and truncate at tip, anterior marginals short, half as long as postoculars; other bristles subequal in length to postoculars or with the pair at the anterior angles slightly shorter. Pterothorax slightly wider than prothorax,

sides straight and converging posteriorly. Wings colorless, distinctly broader in basal than in apical half, slightly narrowed at middle, not closely fringed (the posterior margin with only about 52 hairs), subapical fringe double for about nine hairs. Legs rather stout, fore tarsus with a short, stout, acute tooth.

Abdomen little, if any, broader than pterothorax, broadest toward base, thence rounded gradually to base of tube. Tube about 0.6 as long as head, 2.3 times as long as basal width, about 1.8 times as wide at base as at apex, sides straight. Lateral bristles of moderate length, knobbed, yellowish, two pointed pairs at apex of segment 9 longer; terminal bristles about as long as tube, brown.

Measurements of holotype: Length 1.64 mm.; head, length 0.288 mm., width 0.234 mm.; prothorax, length 0.139 mm., width (inclusive of coxæ) 0.352 mm.; mesothorax, width across fore margin 0.396 mm.; metathorax, width across hind margin 0.354 mm.; abdomen, width 0.414 mm.; tube, length 0.174 mm., width at base 0.075 mm., at apex 0.042 mm. Antennal segments: 1, 33 μ ; 2, 54 μ ; 3, 78 μ ; 4, 75 μ ; 5, 69 μ ; 6, 54 μ ; 7, 48 μ ; 8, 31 μ ; total length of antenna, 0.44 mm., width at segment 4, 0.035 mm.

Female (forma brachyptera).—Apparently identical with the winged form in all points of structure; pterothorax perhaps slightly smaller and weaker.

Male (forma brachyptera).—Length about 1.3 mm. Head very slightly longer than in female, about 1.3 times as long as wide; postocular bristles nearly half as long as head, invariably bent at middle and curving forward. Femora and tibiae swollen; tarsal tooth large, nearly straight, about two-thirds as long as eye. Prothoracic bristles scarcely longer than in female.

Described from 13 females (of which four are brachypterous) and 8 males, all from Illinois, as follows: Cherry Valley, August 14, 1909, Hugh Glasgow, 2 brachypterous females, "in old mines of Scolytids"; Desplaines, September 5, 1908, J. J. Davis, 1 male under bark on apple tree; Dubois, October 1, 1908, L. M. Smith, 1 brachypterous female on hickory branch; Dubois, July 13, 1909, C. A. Hart, 1 male on hackberry; Grand Tower, June 30, 1909, C. A. H., 1 macropterous female on locust; Odin, September 29, 1908, L. M. S., 1 brachypterous female on hackberry; Parker, July 14, 1909, C. A. H., 1 macropterous female on willow; "Marion, 1909, reared from galls on twigs of pin oak (*Quercus palustris* Muench.), taken July 18 by W. P. Flint, adults found August 18 in breeding cage by James Zetek, Exp. 4499 Ill. State Lab. Nat. Hist.", 6 macropterous females and 5 males; Southern Illinois, C. A. H., from elm covered with trumpet creeper (*Tecoma radicans* (L.) Juss.).

Type locality: Marion, Illinois.

This is an anomalous member of its genus, and may easily be known by the rounded vertex, the peculiarly shaped head

with a pair of long, knobbed bristles on dorsum, and by the number and disposition of the sense cones. It approaches the genus *Cryptothrips* in several points of structure. The male is of special interest in that the postocular bristles, instead of those at the anterior prothoracic angles, are increased in length, which is in marked contrast to a reverse tendency shown in the other species.

Phlæothrips (Hoplandrothrips) insolens, new species. (Pl. v, fig. 4; VIII, figs. 1-3.

Female (macropterous).—Length about 1.7 mm. General color dark blackish brown, with sparse, irregular, maroon pigmentation in head, thorax, and abdomen, exclusive of tube; antennæ with basal half of segment 3 yellow, and pedicels of 4-6 yellow or gray; tibiæ and tarsi pale lemon-yellow.

Head about 1.5 times as long as wide, fully 2.6 times as long as prothorax; sides subparallel, converging roundly to eyes, slightly diverging at base, which is noticeably wider than greatest distance across eyes and without evident neck-like constriction; lateral surfaces noticeably subreticulate, each cheek with about four rather stout, dark bristles arising from short tubercles; vertex subconical, produced and overhanging; postocular bristles equal in length to eyes, dilated and truncate at tip; middle of dorsum with a pair of pointed accessory bristles half as long as postoculars. Eyes about one-fifth as long as head, subcircular as seen from above. Ocelli of moderate size, equidistant; anterior ocellus borne at tip of vertex, posterior ocelli opposite or in front of centers of eyes. Antennæ about 1.3 times as long as head, slender; segment 1 trapezoidal, broader than long; 2 scarcely twice as long as broad; 3 clavate, about twice as long as its greatest width, distinctly sinuate on inner side, pedicel curved slightly outward; 4 clavate, subequal in width to 3, fully twice as long as wide, broadest beyond middle; 5 slightly shorter and narrower than 4, of nearly similar form; 6 and 7 oblong, pedicellate, truncate at apex, broadest about middle, 7 twice as long as wide; 8 sublanceolate, briefly and very distinctly pedicellate. Sense cones short, those on segment 3 less than one-third the length of the segment; formula: 3, 1-2; 4, 1-2; 5, 1-1⁺; 6, 1-1⁺; 7 with one of dorsum near apex. Mouth cone slender, nearly attaining mesosternum, labium broadly rounded at tip, slightly surpassed by labrum.

Prothorax a little less than 0.4 as long as head and (inclusive of eoxæ) fully two and one-half times as wide as long; pronotum non-sculptured, anterior and posterior margins nearly concentric; all usual bristles present, slightly dilated and truncate at tip, anterior marginals short, half as long as postoculars, other bristles subequal in length to postoculars, or the pair at the anterior angles slightly shorter. Pterothorax slightly wider than prothorax, sides straight and converging posteriorly. Wings uniform brownish yellow, probably of normal structure, subapical fringe double for about eight hairs. Legs rather stout, fore tarsi without trace of tooth.

Abdomen little, if any, broader than pterothorax, broadest toward base, thence rounded gradually to base of tube; tube 0.6 as long as head, 2.8 times as long as basal width, slightly less than twice as wide at base as at apex, sides straight except for a slight constriction at basal fourth. Lateral bristles of moderate length, knobbed, yellowish, two pointed pairs at apex of segment 9 longer; terminal bristles about equal in length to tube, brown.

Measurements of holotype: Length 1.68 mm.; head, length; 0.318 mm., width across middle 0.216 mm.; prothorax, length 0.120 mm., width (inclusive of coxæ) 0.307 mm.; mesothorax, width across fore margin 0.338 mm.; metathorax, width across hind margin 0.300 mm.; abdomen, width 0.348 mm.; tube, length 0.192 mm., width at base 0.069 mm., at apex 0.038 mm. Antennal segments: 1, 30 μ ; 2, 54 μ ; 3, 70 μ ; 4, 65 μ ; 5, 63 μ ; 6, 54 μ ; 7, 47 μ ; 8, 39 μ ; total length of antenna, 0.42 mm.; width at segment 4, 0.031 mm.

Described from one female taken on elm at Dubois, Illinois, July 3, 1909, by Mr. Charles A. Hart.

The unarmed fore tarsus, if constant, is a remarkable character, occurring nowhere else in the genus. The sculpture of the head, the pedicellate last segment of the antenna, the slender tube, and the coloration of the legs, all tend to make this a very isolated species.

Genus **CRYPTOTHRIPS** Uzel.

Cryptothrips longiceps, new species. (Pl. VIII, fig. 5.)

Female (forma brachyptera).—Length about 2.2 mm. Color dark blackish brown or black, with pedicel of third antennal segment yellow.

Head rectangular, about 1.65 times as long as wide, sides perfectly parallel; lateral and dorsal surfaces subreticulate toward base, set with several short spines and a longer pair at middle of dorsum; vertex truncate; post-ocular and postocellar bristles long, pointed, subequal; a minute bristle each side of median ocellus and a much longer pair external to these. Eyes moderate in size, not protruding, occupying the anterior angles of the head, and, seen from above, quadrangular in form, their caudad and medial margins forming nearly a right angle. Ocelli small, about equal in size to facets of eyes; anterior ocellus nearly overhanging; posterior ocelli opposite center of eyes and almost touching their inner margins. Antennæ 1.5 times as long as head, of normal form and structure (Pl. VIII, fig. 5). Mouth cone slightly wider than long, reaching nearly to posterior margin of prosternum; tip of labrum just attaining tip of broadly rounded labium.

Prothorax about two-thirds as long as width of head, and (inclusive of coxæ) about 2.5 times as wide as long, without median thickening; usual spines all present, nearly pointed, the two pairs near the posterior angles much the longest, all others moderately short. Pterothorax slightly wider than prothorax; sides subparallel. Legs concolorous with body; fore tarsus unarmed.

Abdomen stout, heavy, about 1.4 times as broad as pterothorax, widest at about segment 3, thence tapering roundly to base of tube. Tube slightly more than 0.6 as long as head, slightly constricted just before apex, which is about half as wide as base. Lateral bristles on segment 9 as long as tube; terminal bristles about three-fourths as long as tube.

Measurements of holotype: Length 2.17 mm.; head, length 0.396 mm., width 0.240 mm.; prothorax, length along median dorsal line 0.156 mm., width (inclusive of coxæ) 0.396 mm.; pterothorax, width 0.420 mm.; abdomen, width 0.600 mm.; tube, length 0.248 mm., width at base 0.099 mm., at apex 0.051 mm. Antennal segments: 1, 48 μ ; 2, 75 μ ; 3, 102 μ ; 4, 97 μ ; 5, 88 μ ; 6, 78 μ ; 7, 55 μ ; 8, 48 μ ; total length of antenna, 0.59 mm., width at segment 4, 0.042 mm.

Male (forma brachyptera).—Length about 1.68 mm. Color and general structure nearly as in female. Head distinctly shorter than combined lengths of segments 1-5 of antennæ. Pronotum with front margin evenly rounded, no median chitinous thickening; fore femora slightly less than 0.6 as long as head; fore tarsi armed with a large, stout tooth.

Measurements of allotype: Length 1.68 mm.; head, length 0.328 mm., width 0.200 mm.; prothorax, length along median dorsal line 0.150 mm., width (inclusive of coxæ) 0.352 mm.; pterothorax, width 0.384 mm.; abdomen, width 0.504 mm.; tube, length 0.210 mm., width at base 0.084 mm., at apex 0.045 mm. Antennal segments: 1, 39 μ ; 2, 63 μ ; 3, 85 μ ; 4, 82 μ ; 5, 79 μ ; 6, 65 μ ; 7, 48 μ ; 8, 44 μ ; total length of antenna, 0.51 mm., width at segment 4, 0.038.

Described from 2 females and 1 male, all from Illinois, as follows: Carbondale, September 21, 1908, 1 female and 1 male, on peach branch, L. M. Smith; Parker, July 14, 1909, 1 female, on hickory branch, C. A. Hart.

Though resembling *C. carbonarius* in the elongate head and the arrangement of the cephalic and prothoracic bristles, this species is of quite different appearance and much smaller size. In *carbonarius*, of which the female is unknown, the fore femora of the winged male are about 0.8 as long as the head, which is about equal to the length of the first five antennal segments; in the present species the femora of the male are less than 0.6 as long as the head, and the latter is distinctly shorter than the first five antennal segments.

Cryptothrips exiguus, new species. (Pl. VIII, fig. 4.)

Female (forma macroptera).—Length about 1 mm. General color dark luteous, with abdomen blackish brown; internal pigment irregular, maroon in color; head and thorax darkened at sides with blackish; legs concolorous with lighter portions of body, tarsi and apical portion of tibiæ dull yellow; antennæ nearly uniform gray.

Head about 1.25 times as long as wide, sides straight and nearly parallel; vertex produced, slightly overhanging, bluntly conical; lateral and dorsal

surfaces almost without sculpture, set with a few short, weak spines arising from barely perceptible elevations; postocular bristles alone prominent, about one and one-third times as long as eyes, dilated at tip; postocellar bristles minute. Eyes small, retracted, but little more than one-fifth as long as head, nearly circular as seen from above. Ocelli of moderate size; median ocellus situated on dorsum of apex of produced vertex, slightly in advance of anterior margin of eyes; posterior ocelli opposite anterior third of eyes, nearly touching their inner margins, and slightly more distant from each other than from the anterior ocellus. Antennæ just one and two-thirds times as long as head, more slender than usual; segment 1 slightly broader than long; 2 about 1.6 times as long as wide; 3 clavate, twice as long as wide, broader at apical third, pedicel narrow, not more than one-fifth greatest width of segment; 4-7 slightly more than twice as long as wide, truncate-fusiform, with short pedicels; 8 three times as long as wide, oblong-conical, slightly narrowed at base; antennæ nearly uniform blackish gray, segments 1 and 2 darker; 3 paler in basal two-thirds. Mouth cone wider than long, reaching posterior margin of prosternum; tip of labrum just attaining tip of broadly rounded labium.

Prothorax about half as long as head and (inclusive of coxæ) about two and one-third times as wide as long; pronotum non-sculptured, without median thickening; anterior and posterior margins concentric; usual bristles all present, very slender, subequal in length to postoculars, slightly dilated at tip. Pterothorax slightly wider than prothorax, sides straight, converging posteriorly. Wings present (not spread in the single example), sparsely fringed. Legs rather slender; fore tarsi unarmed.

Abdomen moderately slender, only slightly broader than pterothorax, broadest at about segment 3, thence tapering roundly to base of tube; tube evenly tapering, slightly more than half as long as head and less than twice as long as basal width, which is more than twice the apical. Lateral bristles on segment 9 fully as long as tube, slightly longer than terminal bristles.

Measurements of holotype: Length 1.03 mm.; head, length 0.192 mm., width 0.156 mm.; prothorax, length 0.100 mm., width (inclusive of coxæ) 0.238 mm.; pterothorax, width 0.264 mm.; abdomen, width 0.282 mm.; tube, length 0.108 mm., width at base 0.062 mm., at apex 0.027 mm. Antennal segments: 1, 27 μ ; 2, 42 μ ; 3, 48 μ ; 4, 45 μ ; 5, 47 μ ; 6, 44 μ ; 7, 41 μ ; 8, 27 μ ; total length of antenna, 0.32 mm., width at segment 4, 0.023 mm.

Described from 1 female taken in sweepings at Grand Tower Illinois, July 12, 1909, by Mr. Charles A. Hart.

This species is abundantly distinguished by its small size, the form of the antennal segments, and the long, blunt, postocular and prothoracic bristles. In several respects it shows an interesting approach to the genus *Phloothrips*.

Genus **GASTROTHRIPS** nov.

(γαστρήρ, the abdomen; θρῦψ, a wood worm.)

Head little, if any, longer than wide, rounded in front, vertex evenly declivous; cheeks rounded, with a few short spines, which are sometimes stout and raised upon barely visible tubercles. Eyes small or moderate, subquadrangular, their caudad and mediad margins forming a more or less evident right angle; interval between eyes much more than their own dorsal width. Ocelli of posterior pair widely separated, nearly contiguous to inner margins of eyes. Antennæ eight-segmented; intermediate segments produced beneath in a subtriangular process; last segment slender, subpedicellate. Mouth cone broad, nearly attaining posterior margin of prosternum; labium semicircularly rounded at apex, subequal in length to labrum. Pronotum shorter than head, trapezoidal, twice as broad across posterior angles (inclusive of coxæ) as median dorsal length; posterior and anterior margins concentric. Legs moderate; fore tarsi sometimes armed. Wings, when present, slender, not closely fringed, without double subapical fringe on posterior margin. Abdomen moderate or heavy; tube short to medium, more or less abruptly constricted at apex.

Type: Gastrothrips ruficauda, new species.

As above defined, this genus will prove a moderately large one, comprising species which for the most part live under bark—principally, it seems, in the southern States. In addition to the two species herein described as new, two or three others are known to me from uniques. All resemble the species of *Cryptothrips* in no slight degree, especially in the form and structure of the mouth cone, antennæ, and eyes. They constitute, however, a distinct type of radically different facies, recognized at once by the shorter head and the abruptly constricted tube.

Gastrothrips ruficauda, new species. (Pl. VIII, figs. 6, 7.)

Female (forma brachyptera).—Length about 1.4 mm. General color dark blackish brown or black, thorax slightly paler; antennal segments 1 and 2 blackish brown, the latter paler apically, where it is concolorous with pedicel of 3, the remainder of antenna almost jet black, even in balsam mounts; apical half of all femora and middle portion of fore tibiæ pale yellowish, sometimes nearly white, the remainder of legs dark blackish brown, tarsi paler; tube abruptly bright brown-red, with apex black.

Head slightly wider than long, rounded in front, broadest midway between eyes and base, vertex evenly declivous; lateral and dorsal surfaces without sculpture, set with a few short, rather stout spines; postocular bristles alone prominent, sometimes half as long as head, pointed; post-ocellar bristles minute. Eyes small, not protruding, subquadrangular, their caudad and mediad margins forming a more or less evident right angle,

on ventral surface of head angulate posteriorly and slightly prolonged; interval between eyes about twice their own dorsal width. Ocelli small; anterior ocellus scarcely overhanging; posterior ocelli much more distant from each other than from the anterior ocellus, nearly contiguous to eyes and slightly posterior to their anterior third. Antennæ about twice as long as head, formed much as in *Cryptothrips*; segment 1 trapezoidal, fully as broad as long; 2 about two-thirds as wide as long; 3 clavate, twice as long as greatest width, thrice as wide as pedicel at base, sides almost straight; 4 distinctly shorter and stouter, two-thirds as wide as long; 5 slightly longer than 4, of similar form and equal width; 6 equal and similar to 5 but slightly narrower; 7 distinctly shorter, 0.7 as broad as 4, broadest near base, truncate at apex, pedicellate; 8 slender, only slightly shorter than 7, broadest at basal two-fifths, ventral surface with about six comb-like bristles. Mouth cone broad, nearly attaining posterior margin of prosternum; labium semicircularly rounded at apex, subequal in length to labrum.

Prothorax about 0.7 as long as head and (inclusive of coxæ) about 2.3 times as wide as long; pronotum non-sculptured, without median thickening; anterior and posterior margins concentric; all usual bristles present, pointed, the anterior marginals greatly reduced and scarcely visible, the two pairs at the posterior angles much the longest, about four times as long as midlaterals and the pair at the anterior angles. Pterothorax reduced, about as long as prothorax, sides nearly parallel. Legs short, rather stout; fore tarsi unarmed.

Abdomen stout, nearly 1.5 times as wide as prothorax, broadest at about segment 5, thence rounded evenly to base of tube. Tube about 0.8 as long as broad, twice as long as basal width, very abruptly constricted at apex, where it is half as wide as at base, intermediate portion slightly tapering. Lateral bristles on segments 6-9 fully as long as tube, nearly black; terminal bristles two-thirds as long as tube.

Measurements: Length 1.36 mm.; head, length 0.184 mm., width 0.208 mm.; prothorax, length 0.136 mm., width (inclusive of coxæ) 0.316 mm.; pterothorax, width 0.336 mm.; abdomen, width 0.452 mm.; tube, length 0.152 mm., width at base 0.079 mm., at apex 0.036 mm. Antennal segments: 1, 33 μ ; 2, 54 μ ; 3, 60 μ ; 4, 50 μ ; 5, 54 μ ; 6, 54 μ ; 7, 41 μ ; 8, 38 μ ; total length of antenna, 0.384 mm., width at segment 4, 0.033 mm.

Described from 3 females taken from branches of grape, sycamore, and overcup oak (*Quercus lyrata* Walt.), respectively, at Grand Tower and Pulaski, Illinois, by C. A. Hart and L. M. Smith, in October and July.

The broad head, unarmed fore tarsi, and the short, red tube should serve to distinguish this species from the following.

Gastrothrips texanus, new species. (Pl. IV, fig. 7.)

Female (forma macroptera).—Length about 1.4 mm. General color dark blackish brown, nearly black posteriorly; antennal segments 1 and 2

blackish brown, the latter paler apically, where it is concolorous with pedicel of 3, the remainder of antenna almost black; extreme apex of all femora, middle portion of fore tibiae, and the fore tarsi pale yellowish, the remainder of legs concolorous with body; tube jet black, opaque.

Head about as broad as long, rounded in front, broadest midway between eyes and base, vertex evenly declivous; lateral and dorsal surfaces without sculpture, set with a few short, stout, brown spines, which are raised upon barely visible tubercles; postocular bristles alone prominent, a little more than one-third as long as head, nearly pointed, postocellar bristles minute. Eyes small, not protruding, subquadrangular, on ventral surface of head rounded posteriorly and not prolonged; interval between eyes about twice their own dorsal width. Ocelli moderate in size; anterior ocellus scarcely overhanging; posterior ocelli much more distant from each other than from the anterior ocellus, nearly contiguous to eyes and slightly posterior to their anterior third. Antennae about twice as long as head, of nearly identical structure with those of the preceding species. Mouth cone broad, nearly attaining posterior margin of prosternum; labium semi-circularly rounded at apex, subequal in length to labrum.

Prothorax about 0.64 as long as head and (inclusive of coxae) about 2.4 times as wide as long; pronotum non-sculptured, with slight median thickening; anterior and posterior margins concentric; all usual bristles present, all except the two pairs near the posterior angles greatly reduced in size, midlaterals longer, inner posterior pair half as long as the nearly pointed outer pair. Pterothorax with sides nearly straight, converging posteriorly. Fore wings of nearly equal width throughout, about ten times as long as wide, without double, subapical fringe on posterior margin, lightly washed with brown, darker at base. Legs of medium length, moderately stout; fore tarsi armed with a long, slightly curved, acute tooth.

Abdomen moderately slender, about 1.3 times as broad as prothorax, broadest at about segment 5, thence rounded evenly to base of tube. Tube fully as long as head, about 2.5 times as long as basal width, abruptly constricted at apex, where it is half as wide as at base; intermediate portion tapering only slightly. Lateral bristles on segments 7 and 9 nearly as long as tube, brownish yellow in color; terminal bristles about half as long as tube.

Measurements of holotype: Length 1.40 mm.; head, length 0.198 mm., width 0.196 mm.; prothorax, length 0.127 mm., width (inclusive of coxae) 0.308 mm.; pterothorax, width 0.348 mm.; abdomen, width 0.396 mm.; tube, length 0.204 mm., width at base 0.081 mm., at apex 0.041 mm. Antennal segments: 1, 33 μ ; 2, 57 μ ; 3, 60 μ ; 4, 53 μ ; 5, 54 μ ; 6, 54 μ ; 7, 42 μ ; 8, 36 μ ; total length of antenna, 0.38 mm.; width at segment 4, 0.031 mm.

Described from 1 female taken by Mr. Hart on huisache (*Acacia farnesiana* Willd.), at Brownsville, Texas, June 29, 1908.

This species should easily be known from the preceding by the longer, narrower head, the armed fore tarsus, and the long, black tube, which is fully as long as the head.

EXPLANATION OF PLATES.

PLATE IV.

- FIG. 1. *Æolothrips vittipennis* sp. nov. Head and prothorax, female, showing sculpture of portion of occiput; $\times 93$,
 2. *Æolothrips vittipennis*. Left antenna, female; $\times 231$.
 3. *Æolothrips fasciatus* Linné. Left antenna, female; $\times 231$.
 4. *Æolothrips bicolor* Hinds. Left antenna, female; $\times 231$.
 5. *Æolothrips crassus* sp. nov. Right antenna, female; $\times 206$.
 (Sense areas not shown on segments 3 and 4.)
 6. *Æolothrips crassus*. Head and prothorax, female; $\times 93$.
 7. *Gastrothrips texanus* sp. nov. Tip of abdomen, female; $\times 94$.

PLATE V.

- FIG. 1. *Merothrips morgani* gen. et sp. nov. Right antenna, female; $\times 402$.
 2. *Merothrips morgani*. Portion of head and prothorax, male; $\times 352$.
 3. *Merothrips morgani*. Right hind leg, female; $\times 352$.
 4. *Phlæothrips (Hoplandrothrips) insolens* sp. nov. Portion of occiput, showing sculpture; $\times 352$. (See also Pl. VIII, figs. 1-3.)
 5. *Thrips pallicornis* sp. nov. Head and prothorax, female; $\times 93$.
 6. *Thrips pallicornis*. Right antenna, female; $\times 206$.
 7. *Frankliniella stylosa* sp. nov. Right antenna, female; $\times 206$.

PLATE VI.

- FIG. 1. *Zygothrips pallidus* sp. nov. Head and prothorax, male; $\times 120$.
 2. *Zygothrips pallidus*. Left antenna, male; $\times 352$.
 3. *Rhynchothrips dentifer* sp. nov. Head and prothorax, macropterous female; $\times 74$.
 4. *Rhynchothrips pruni* gen. et sp. nov. Head and prothorax, female; $\times 74$.
 5. *Phlæothrips (Hoplandrothrips) uzeli* Hinds. Segment 3 of right antenna, female; $\times 352$.
 6. *Phlæothrips (Hoplandrothrips) xanthopus* subgen. et sp. nov. Segment 3 of right antenna, female; $\times 352$.
 7a. *Phlæothrips (Hoplandrothrips) xanthopus*. Head and prothorax, female; $\times 74$.
 7b. *Phlæothrips (Hoplandrothrips) xanthopus*. Left fore tarsus, female; $\times 74$.

PLATE VII.

- FIG. 1. *Phlæothrips (Hoplandrothrips) funebris* sp. nov. Head and prothorax, female; $\times 81$.
2. *Phlæothrips (Hoplandrothrips) funebris*. Right antenna, female; $\times 248$.
3. *Phlæothrips (Hoplandrothrips) funebris*. Right fore leg, male; $\times 248$.
4. *Phlæothrips (Hoplandrothrips) funebris*. Segment 3 of right antenna, female; $\times 352$.
5. *Phlæothrips (Hoplandrothrips) juniperinus* sp. nov. Segment 3 of right antenna, female; $\times 352$.
6. *Phlæothrips (Hoplandrothrips) juniperinus*. Head and prothorax, female; $\times 74$.
7. *Phlæothrips (Hoplandrothrips) microps* sp. nov. Segment 3 of right antenna, female; $\times 352$.
8. *Phlæothrips (Hoplandrothrips) microps*. Head and prothorax, female; $\times 74$.

PLATE VIII.

- FIG. 1. *Phlæothrips (Hoplandrothrips) insolens* sp. nov. Head and prothorax, female; $\times 74$.
2. *Phlæothrips (Hoplandrothrips) insolens*. Segment 3 of right antenna, female; $\times 352$.
3. *Phlæothrips (Hoplandrothrips) insolens*. Segments 7 and 8 of right antenna, female; $\times 352$.
4. *Cryptothrips exiguus* sp. nov. Head and prothorax, female; $\times 95$.
5. *Cryptothrips longiceps* sp. nov. Head and prothorax, female; $\times 74$.
6. *Gastrothrips ruficauda* gen. et sp. nov. Head and prothorax, female; $\times 74$.
7. *Gastrothrips ruficauda*. Tip of abdomen, female; $\times 74$.